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Sir:

Transmitted herewith for filing is the Patent Application of:

Inventor(s): **Rabindranath Dutta**

For: **SYSTEM AND METHOD FOR DISPLAYING DATA ON A PORTABLE DEVICE**

Enclosed are:

Patent Specification and Declaration

3 sheets of drawing(s).

An assignment of the invention to International Business Machines Corporation (includes Recordation Form Cover Sheet).

A certified copy of a application.

Information Disclosure Statement, PTO 1449 and copies of references.

The filing fee has been calculated as shown below:

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SYSTEM AND METHOD FOR DISPLAYING DATA ON A PORTABLE DEVICE

BACKGROUND OF THE INVENTION

5 **1. Technical Field:**

The present invention generally relates to an improved method of displaying data on a handheld device and in particular to an improved method of displaying data on a handheld device having a display that is significantly larger in one dimension than the other.

10 **2. Description of the Related Art:**

As portable electronics evolve, they are becoming as small as possible to make them as convenient to carry as possible. Unfortunately, this means that the displays on these devices are also very small. As it becomes more common for portable devices such as Personal Digital Assistants (PDAs) and mobile telephones to communicate over the internet, the limitations of these small displays become increasingly apparent.

25 For example, the World Wide Web (Web or WWW) browser on portable telephones phones is becoming increasingly common. Unfortunately, the ideal dimension of a cell phone is constrained by the typical ear to mouth distance of a user, and the user's ease of gripping the telephone by hand. As a result, the display on the portable telephone must be 30 adapted to the long, narrow form of the telephone itself.

Essentially, even if the telephone provides a touch-

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screen keypad on the display itself, the maximum dimensions of the display screen on the telephone is about 2"x6", or 12 square inches. In terms of screen area, this is actually larger in area than typical PDA displays, which have generally about a 3"x3" screen size that measure up to 9 square inches.

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While a significant amount of data can be displayed on a 12 sq. in. display, the long, narrow dimensions of this type of display make it very difficult to display data in a way that it is easily read by the user. Most Web based data will be designed for a screen much larger, in both directions, than the telephone display, and in truncated form, this data is difficult to read from the small display. In particular, although the user may be able to easily read text that scrolls across the wide dimension of the telephone, the user will have much more trouble viewing data that scrolls across the narrow dimension. It would be desirable to provide a means to allow the user to read the display in either direction, according to the data being displayed.

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SUMMARY OF THE INVENTION

It is therefore one object of the present invention to provide an improved method of displaying data on a handheld device.

It is another object of the present invention to provide an improved method of displaying data on a handheld device having a display that is significantly larger in one dimension than the other.

The foregoing objects are achieved as is now described. The preferred embodiment provides a system, method, and program product which enables the display on a portable device to "flip" itself between different screen orientations such that both the narrow dimension and wide dimension of the display can be exploited. The preferred embodiment is particularly adapted to displaying Web data on wireless devices such as a portable telephone, wherein the Web data can be effectively displayed by flipping the display orientation between the narrow and wide dimensions of the display. The flipping between screen orientations can be selected by user action or done dynamically by the portable device itself.

The above as well as additional objectives, features, and advantages of the present invention will become apparent in the following detailed written description.

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BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself however, as well as a preferred mode of use, further objects and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

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Figure 1 depicts a block diagram of a portable device in accordance with a preferred embodiment of the present invention;

Figures 2A and 2B are exemplary diagrams of the display of a portable telephone in accordance with a preferred embodiment of the present invention; and

Figure 3 is a flowchart of a process in accordance with the preferred embodiment of the present invention.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures, and in particular with reference to **Figure 1**, a block diagram of a portable device in accordance with the preferred embodiment is shown. The portable device, which may be a portable telephone, a PDA, a pager, or other device with an integrated display, comprises a processor **105**, which can write to display **110**. The processor **105** can also read and write to memory **115**. Communications means **120** enables the processor to communicate over a wireless network, which in the preferred embodiment is a wireless telephone network. It should be noted that the communications means **120** is not necessarily integral to the portable device, but instead may be cable connected to the portable device. For example, the portable device may be a PDA, which is connected via a cable to a wireless telephone, wherein the telephone functions as the communications means **120**. Alternatively, the portable device may be a portable telephone with an integrated wireless communications means **120**.

The preferred embodiment provides a system, method, and program product which enables the display on a portable device to "flip" itself between different screen orientations such that both the narrow dimension and wide dimension of the display can be exploited. The preferred embodiment is particularly adapted to displaying Web data on wireless devices such as a portable telephone, wherein the Web data can be effectively displayed by flipping the display orientation between the narrow and wide dimensions of the display. The flipping between screen orientations can be selected by user action or done dynamically by the

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portable device itself.

5 **Figures 2A and 2B** are exemplary diagrams of the display of a portable telephone in accordance with a preferred embodiment of the present invention. These two figures show the same telephone **205**, which has a display **210**. Display **210** is shown as extending across most of the face of the telephone **205**, with a microphone **215** located at one end of the display and a speaker **220** located at the opposite end of the display.

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The difference between these figures is the data **225/230** shown on the displays **210** themselves. In **Figure 2A**, data **225** is shown oriented so that the text is read across the narrow dimension of the display **210**, as is conventional with current telephones. Here, it is clear that reading the display is very difficult. In **Figure 2B**, however, the data **230** has been rotated 90 degrees so that it extends across the wide dimension of display **210**. In this case, the data **230** is much easier to read.

25 Of course, the data being displayed at any given time will determine whether it would preferably be displayed across the narrow dimension as is data **225**, or across the wide dimension as is data **230**. Therefore, the preferred embodiment provides that the user can choose either display mode at any time, and can easily "flip" between the wide and narrow views. The actual software or firmware programming needed to display the data in these two modes is considered well within the abilities of persons of ordinary skill in the art.

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According to the preferred embodiment, the user is provided with a mechanism to choose the display mode. This mechanism can be implemented by an actual button on the telephone, or by a touch-sensitive selection "button" on the display 210 itself. As the user repeatedly activates the mechanism, the display will flip back-and-forth between the two display modes.

Alternatively to or in combination with the preferred embodiment, the internet browser software or display manager software of the portable device itself can automatically determine the best orientation of the display data, and can alternate between the display modes.

Figure 3 is a flowchart of a process in accordance with the preferred embodiment of the present invention. Here, the user first requests a web page, or other data page, using the wireless device (**step 305**). Next, the device receives the requested web page, or a truncated wireless markup language (WML) version of the requested web page (**step 310**).

The device then displays the page in the default orientation (**step 315**), which will be referred to as Display Model. The user can set the default orientation to either the wide or narrow orientation. Alternatively, the device can automatically determine the best-fit orientation for the display. By examining the line-width of the text being received, the device will determine whether the wide or narrow orientation will be used as the default orientation for that set of text.

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Next, if the device is set to automatically move between display modes (**step 320**), then it will wait for a preset delay period (**step 325**), and then redisplay the page with a 90 degree rotated orientation (**step 330**), which will be referred to as Display Mode2.

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Otherwise, the system will wait for a user input. When the user activates the display change mechanism (**step 335**), as described above, the device will redisplay the page in Display Mode2 (**step 440**). The process then repeats (**step 305**).

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Of course, at any point during this process the user can interact with the device to navigate web pages, edit text, make telephone calls, or perform other functions of the device. These are not included in the flowchart of **Figure 3** as they are not essential to the function of the preferred embodiment.

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It is important to note that while the present invention has been described in the context of a fully functional data processing system and/or network, those skilled in the art will appreciate that the mechanism of the present invention is capable of being distributed in the form of a computer usable medium of instructions in a variety of forms, and that the present invention applies equally regardless of the particular type of signal bearing medium used to actually carry out the distribution.

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Examples of computer usable mediums include: nonvolatile, hard-coded type mediums such as read only memories (ROMs) or erasable, electrically programmable read only memories (EEPROMs), recordable type mediums such as floppy disks,

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hard disk drives and CD-ROMs, and transmission type mediums such as digital and analog communication links.

5 While the invention has been particularly shown and described with reference to a preferred embodiment, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention.

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CLAIMS:

What is claimed is:

1. A method for displaying data on a portable device, comprising the steps of:

3 receiving a data page in the portable device;

4 displaying the data page, in a first orientation, on
5 the portable device; and

6 selectively redisplaying the data page in a second
7 orientation on the portable device.

2. The method of claim 1, wherein the data page is received over a wireless connection.

3. The method of claim 1, wherein the second orientation is a ninety-degree rotation of the first orientation.

4. The method of claim 1, wherein the device comprises a display that is significantly larger in a first dimension than in a second direction orthogonal to the first dimension.

1 5. The method of claim 1, wherein the data page is
2 redisplayed in response to a user input.

1 6. The method of claim 1, wherein the data page is
2 redisplayed after a preset duration.

1 7. The method of claim 1, wherein the portable device is a
2 wireless telephone.

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1 8. The method of claim 1, wherein the portable device is a
2 personal digital assistant.

1 9. The method of claim 1, further comprising the step of
2 analyzing the data page, by the portable device, to
3 automatically determine the first orientation for the data
4 page.

1 10. A portable data processing system, having a processor,
2 writeable memory, and a display, comprising:

3 means for receiving a data page in the portable data
4 processing system;

5 means for displaying the data page, in a first
6 orientation, on the display of the portable data processing
7 system; and

8 means for selectively redisplaying the data page in a
9 second orientation on the display of the portable data
10 processing system.

11. The portable data processing system of claim 10,
wherein the data page is received over a wireless
connection.

12. The portable data processing system of claim 10,
wherein the second orientation is a ninety-degree rotation
of the first orientation.

13. The portable data processing system of claim 10,
wherein the display is significantly larger in a first
dimension than in a second direction orthogonal to the first
dimension.

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1 14. The portable data processing system of claim 10,
2 wherein the data page is redisplayed in response to a user
3 input.

1 15. The portable data processing system of claim 10,
2 wherein the data page is redisplayed after a preset
3 duration.

1 16. The portable data processing system of claim 10,
2 wherein the portable data processing system is a wireless
3 telephone.

1 17. The portable data processing system of claim 10,
2 wherein the portable data processing system is a personal
3 digital assistant.

1 18. The portable data processing system of claim 10,
2 further comprising means for analyzing the data page, by the
3 portable data processing system, to automatically determine
4 the first orientation for the data page.

1 19. A computer program product on a computer-readable
2 medium, comprising:
3 instructions for receiving a data page in a portable
4 device;
5 instructions for displaying the data page, in a first
6 orientation, on the display of the portable device; and
7 instructions for selectively redisplaying the data page
8 in a second orientation on the display of the portable
9 device.

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1 20. The computer program product of claim 10, wherein the
2 data page is received over a wireless connection.

1 21. The computer program product of claim 10, wherein the
2 second orientation is a ninety-degree rotation of the first
3 orientation.

1 22. The computer program product of claim 10, wherein the
2 display is significantly larger in a first dimension than in
3 a second direction orthogonal to the first dimension.

1 23. The computer program product of claim 10, wherein the
2 data page is redisplayed in response to a user input.

1 24. The computer program product of claim 10, wherein the
2 data page is redisplayed after a preset duration.

1 25. The computer program product of claim 10, wherein the
2 portable device is a wireless telephone.

1 26. The computer program product of claim 10, wherein the
2 portable device is a personal digital assistant.

1 27. The computer program product of claim 10, further
2 comprising instructions for analyzing the data page, by the
3 portable device, to automatically determine the first
4 orientation for the data page.

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SYSTEM AND METHOD FOR DISPLAYING DATA ON A PORTABLE DEVICE

ABSTRACT OF THE DISCLOSURE

A system, method, and program product which enables the display on a portable device to "flip" itself between different screen orientations such that both the narrow dimension and wide dimension of the display can be exploited. The preferred embodiment is particularly adapted to displaying Web data on wireless devices such as a portable telephone, wherein the Web data can be effectively displayed by flipping the display orientation between the narrow and wide dimensions of the display. The flipping between screen orientations can be selected by user action or done dynamically by the portable device itself. The portable device can automatically determine the initial orientation for a data page, by analyzing the page as it is received.

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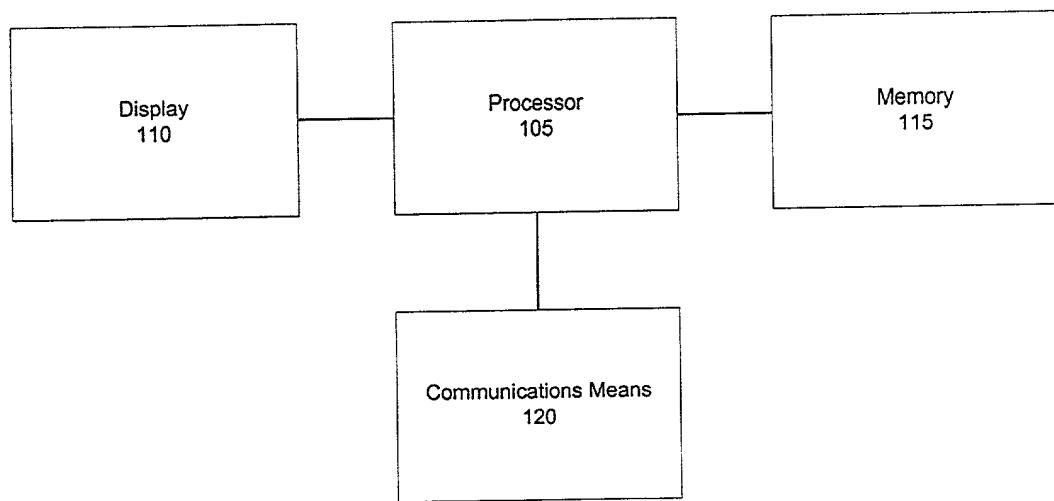


Figure 1

Four score and seven years ago, our Fathers brought forth upon this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created

Four score and seven years ago, our Fathers brought forth upon this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal.

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Fig 2B
• 220

205
}

215

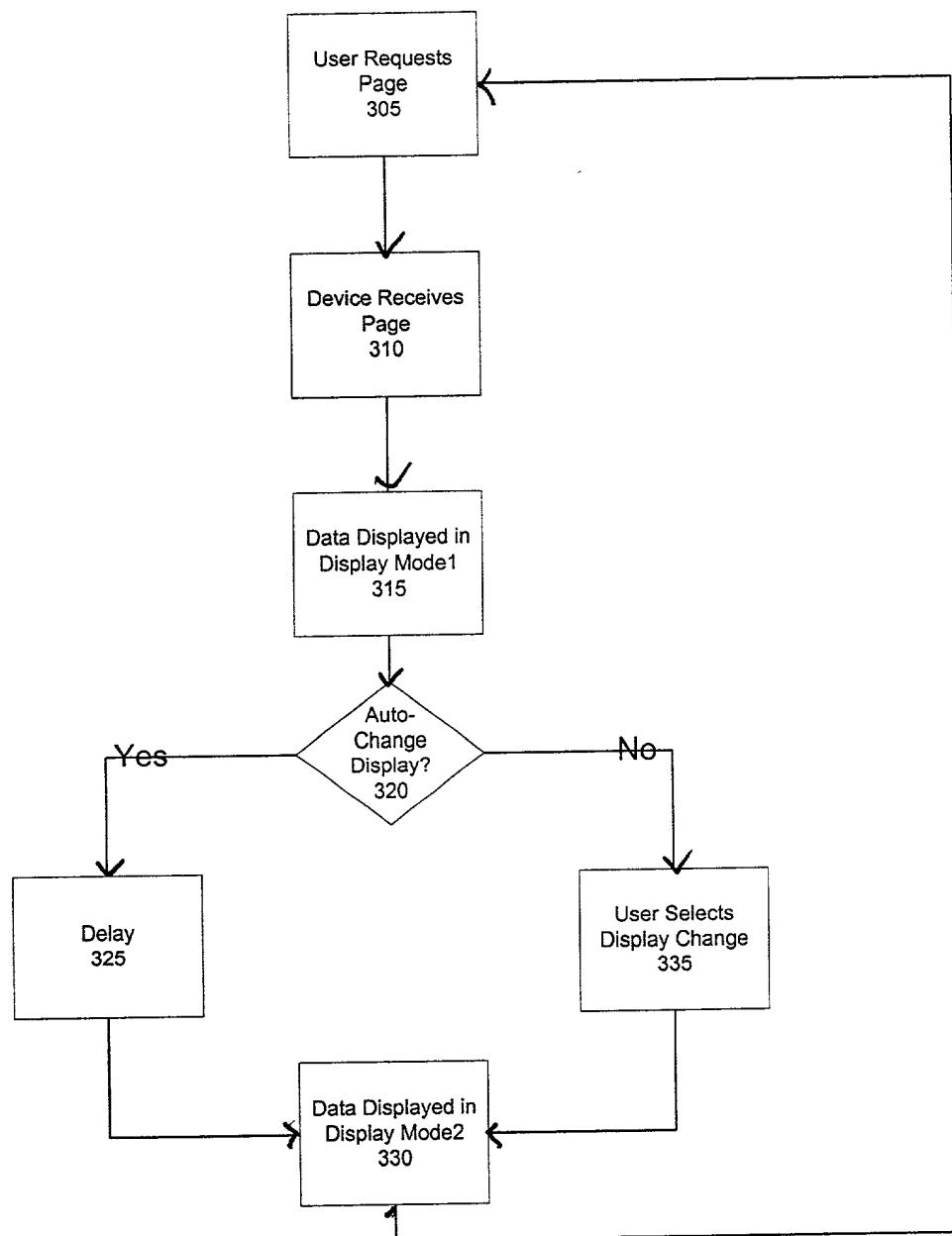
~205

210

Fig 2A

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DECLARATION AND POWER OF ATTORNEY FOR

PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled

SYSTEM AND METHOD FOR DISPLAYING DATA ON A PORTABLE DEVICE

the specification of which (check one)

is attached hereto.

was filed on _____
 as Application Serial No. _____
 and was amended on _____
 (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):

Priority Claimed

<u>(Number)</u>	<u>(Country)</u>	<u>(Day/Month/Year)</u>	<u>Yes</u> <u>No</u>
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I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose information material to the patentability of this application as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

<u>(Application Serial #)</u>	<u>(Filing Date)</u>	<u>(Status)</u>
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and

further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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